

Materials and Structures Optimization / Process Development for the Mega-ROSA / ROSA Solar Array, Phase I

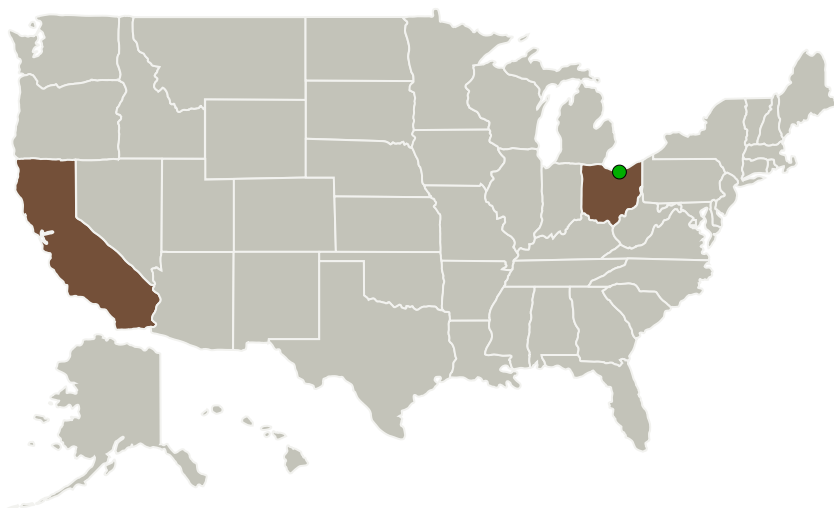
Completed Technology Project (2012 - 2013)



Project Introduction

Deployable Space Systems, Inc. (DSS), in collaboration with the University of California, Santa Barbara (UCSB), Department of Mechanical Engineering, will focus the proposed NASA STTR Phase 1 program on the materials optimization, structures optimization, and manufacturing process optimization/development for the Mega-ROSA/ROSA solar array. The ROSA technology (termed for: Roll-Out Solar Array) is a new/innovative mission-enabling solar array system that offers maximum performance in all key metrics and unparalleled affordability for NASA's Space Science & Exploration missions. ROSA will enable NASA's emerging Solar Electric Propulsion (SEP) Space Science & Exploration missions through its ultra-affordability, ultra-lightweight, ultra-compact stowage volume, high strength/stiffness, and its high voltage and high/low temperature operation capability within many environments. The ROSA technology will provide NASA/industry a near-term and low-risk solar array system that provides revolutionary performance in terms of high specific power (>200-500 W/kg BOL at the wing level, PV-blanket dependent), affordability (>25-50% projected cost savings at the array level, PV-blanket dependent), ultra-lightweight, high deployed stiffness (10X better than current rigid panel arrays), high deployed strength (10X better than current rigid panel arrays), compact stowage volume (>60-80 kW/m³ BOL, 10X times better than current rigid panel arrays), high deployment reliability and operation reliability, high radiation tolerance, high voltage operation capability (>200 VDC), scalability (500W to 100's of kW), and LILT & HIHT operation capability (LILT – Low Intensity Low Temperature, HIHT – High Intensity High Temperature).

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
University of California-Santa Barbara(UCSB)	Supporting Organization	Academia	Santa Barbara, California

Primary U.S. Work Locations

California	Ohio
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Project Transitions

▶ **February 2012:** Project Start

✓ **February 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140339>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Brian R Spence

Co-Investigator:

Brian Spence

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Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System